INDUSTRIAL HYGIENE INFORMATION AND REGULATORY ACTIONS SUMMARY November 2001

REGULATORY ACTIONS

OSHA Delays Provisions of Recordkeeping Rule

OSHA announced that it would delay for one year the effective date of three provisions of its recordkeeping rule and established interim criteria for recording cases of work-related hearing loss. The provisions, postponed until January 1, 2003, are:

- the criteria for recording work-related hearing loss is defined (for calendar year [CY] 2002, it is a "work-related hearing loss averaging 25dB or more at 2000, 3000, and 4000 hertz in either ear");
- the rule's definition of "musculoskeletal disorder" (MSD) (for CY 2002 it is "work-related injuries and illnesses involving muscles, nerves, tendons, ligaments, joints, cartilage and spinal discs"); and
- the requirement that employers check the MSD column on the OSHA log.

All other provisions of the rule become effective on January 1, 2002. OSHA has indicated that it will continue to evaluate sections 1904.10 and .12 over the next year

OSHA will issue new recordkeeping forms that have been modified to remove the MSD and hearing loss columns from the OSHA 300 Log of Work-Related Injuries and Illnesses and the OSHA 300A Summary of Work-Related Injuries and Illnesses. The instructions accompanying the forms have also been modified to reflect the requirements that will take effect in calendar year 2002. Copies of the forms can be obtained on OSHA's web site at http://www.osha.gov or from the OSHA publications office. The agency will carry out a major outreach effort to help employers and workers understand the new changes, while providing assistance in complying with new recordkeeping requirements. To aid in that effort, OSHA launched a new page on its web site that highlights key provisions and major changes of the new recordkeeping rule. The page, at http://www.osha-slc.gov/recordkeeping/index.html, details training programs and provides various materials designed to aid employers and workers alike.

Full details were published in the October 12, 2001 issue of the Federal Register (available at http://www.osha-slc.gov/FedReg_osha_data/FED20011012.html).

And, finally, a lawsuit filed by the National Association of Manufacturers has been settled, which clears the way of the last remaining obstacle for the rule. In settling the lawsuit, OSHA has pledged to refrain from enforcing the regulation during the first 120 days it is in effect.

Update on OSHA Regulatory Issues

Some of the recent happenings, as reported by the AIHA Government Affairs Office:

- Beryllium. An Emergency Temporary Standard has been requested by industry. The existing standard is 50 years old.

- Steel Erection. At least one major industry group has requested that this standard be delayed. It has already been delayed from this past July to 2002, but this group wants it delayed even more. In a recent letter to the group, OSHA announced that it would not delay the rule past January of 2002.

- Safety and Health Programs. While considered an important issue, and with OSHA announcing that they have made progress on drafting a standard, it is unlikely that this issue will be on the regulatory agenda anytime in the near future.

- VPP. OSHA has been working on this program and has announced that they hope to double the number of sites participating and to enroll more small sites.

- PPE. Insiders believe that this issue will be one of those that make it on the updated regulatory agenda.

- Environmental Tobacco Smoke. After nearly six years of delays, there is a remote possibility that the issue of environmental tobacco smoke will be back for consideration at OSHA. In a unanimous order, the U.S. Court of Appeals has ordered OSHA to "file, within 30 days of the date of this order, a timetable for completion of rulemaking proceedings on the proposed regulation of environmental tobacco smoke in the workplace".

OSHA ACTIVITIES

Henshaw Addresses the National Safety Congress

Newly confirmed OSHA head, John Henshaw, addressed the National Safety Congress in Atlanta. In addressing the situation at "ground zero" in New York City, he indicated that OSHA, along with other federal agencies like EPA and FEMA, are working with the city as it deals with the disaster. OSHA is also working with the private sector to help; Henshaw called on ASSE, AIHA, and the National Safety Council to assist employers seeking advice. These organizations have set up hotlines to handle pro bono advice to

those in the area. Equipment manufacturers also rushed in to supply respirators, gloves, protective clothing, and other items that were handed out at the disaster site.

He stressed the need for a cooperative effort among safety and health professionals with OSHA to protect workers, not just assure compliance. His four priorities for OSHA:

- *Leadership:* Together with professional groups, trade associations, unions and other stakeholders, OSHA needs to lead the national dialogue on safety and health.
- *Strong, effective and fair enforcement*: Enforcement efforts are expected to remain about the same as recent years. The true effectiveness of enforcement depends upon the skills, training and expertise of OSHA inspectors. He is reviewing processes for increasing professional certifications of OSHA inspectors.
- *Expand outreach, education and compliance assistance efforts*: Starting with a major outreach effort on OSHA's new recordkeeping rule, it will involve using user-friendly materials and easy-to-understand presentations and training. See the website for an example at: http://www.osha-slc.gov/recordkeeping/index.html.
- *Expand partnership and voluntary programs*: "We need to involve union, trade and professional groups at the macro and micro levels. Every one of these groups is an opportunity for partnership and every group has the ability to voluntarily improve their safety and health programs." He sees working with graduate programs to address the value of the worker and how accident and illness prevention can add value and avoid costs for business.

Chao Issues Guidelines To Protect Employees From Anthrax Threat Via The Mail

"The risk of exposure to anthrax in most offices is minute, however a few common sense steps should always be taken," Chao said. "These will help companies and their employees reduce the risk of exposure. Now, more than ever, we must work together to protect the health of our employees."

Chao advised workers to exercise good judgment and caution when handling mail and take the following precautionary measures as outlined by OSHA:

- Be on the lookout for suspicious letters and packages, including packages or envelopes of unusual weight or size, packages or envelopes with a handwritten address and/or no return address and packages or envelopes with excessive postage.
- Open packages/envelopes with a minimum amount of movement and always use a letter opener or method that is least likely to disturb the contents.
- Do not blow into envelopes.
- Do not shake or pour out the contents.

- Keep hands away from nose and mouth when opening mail.
- Always wash hands after handling mail.

Chao added that if employers or employees choose to use protective equipment such as gloves, it is important they take necessary steps to make sure these items are handled and used properly.

The Postal Service website provides additional information and detail on anthrax and precautions in handling the mail.
http://www.usps.gov/news/2001/press/serviceupdates.htm

OSHA Consultation Program

OSHA revised and clarified the processes and procedures for administering and monitoring its Consultation Program, and updated and clarified the criteria and requirements for participation in Safety and Health Achievements Recognition Program (SHARP), and outlines the requirements for the monitoring and evaluation system. Specific changes include:

(1) that consultant project efforts are linked to federal or state OSHA's strategic and performance goals,

(2) The employer must agree to post the list of hazards as it was received from the consultation project for either three working days or until the serious hazards are corrected, whichever is later,

(3) that the employer's name and results of the onsite visit remain confidential from state or federal enforcement except in situations where imminent dangers or serious hazards are not corrected as agreed upon or where the employer has inspection deferral status or participates in a state's recognition and exemption program,

(4) that a consultation visit in progress extends from the beginning of the opening conference to the end of the correction due dates including extensions,

(5) that employee participation us required in all visits; and

(6) that to qualify for participation in SHARP, an employer must have reduced the Lost Workday Injury and Illness rate and Total Recordable Case Rate to below the industry average.

For more details see www.osha-slc.gov/OshDoc/Directive_data/TED_3-6.html.

OSHA Urges 14,000 Worksites to Abate Hazards; Targets 1,000

OSHA recently warned 14,000 worksites that have high workplace injury and illness rates and urged them to seek assistance to reduce hazards. As part of its Site - Specific - Targeting program, the agency plans to conduct comprehensive inspection at about 1,000 of the sites – those that reported "especially high" lost–workday injury and illness rates in 1999. The largest site–specific enforcement plan targets a pool of worksites with rates of at least 8 cases per 100 full time employees. The national average for private industry in 1999 was 3 cases per 100 full time employees.

OSHA and EPA Provide Monitoring Data Around WTC Area

Federal agencies were quickly on-site after the collapse of the World Trade Center (WTC) in New York City. In the public interest, they have made sampling data available through their web sites.

OSHA conducted monitoring for asbestos and other contaminants since shortly after the disaster. Their samples taken outside the "hot zone" or rubble pile, during the period September 13 – 27, have shown asbestos levels of <0.003 f/cc to 0.140 f/cc. They indicate that the sample with 0.140 f/cc was not asbestos fibers. The data, obtained by phase contrast microscopy are available for review at http://www.osha.gov/nyc-disaster/map.html. So far, only small percentages of asbestos, or an average of 2.1 to 3.2 percent have been determined, slightly above the 1 percent trigger. OSHA Administrator John Henshaw said that none of the test results indicates contamination "approaching those levels" of 0.1 f/cc. Their posted data reveal occasional high total fiber counts (range 0.000 – 0.140 f/cc), but exclusion of obvious non-asbestos fibers or use of TEM show asbestos concentrations of < 0.034 f/cc. Worker and area samples taken September 26 - October 31 in the WTC hot zone show higher concentrations (up to 0.90 f/cc), but refined data with non-asbestos fibers eliminated do not exceed 0.034 f/cc. Sampling results for other contaminants are also posted.

The EPA has air monitors at 17 locations in lower Manhattan constantly sampling for asbestos. EPA is providing monitoring data for asbestos and other substances from a variety of sources, along with other information, to help people understand how these attacks have affected environmental quality in those areas. Their data may be found at: http://www.epa.gov/epahome/wtc/. They also have summary data from the Pentagon site available.

OSHA Delays Ergonomics Announcement

Officials at the Labor Department announced, that in the wake of the events in New York City, they are temporarily postponing their ergonomics action plan. They were expected to make their plan public in late September, but Agency participation in the rescue and recovery actions at the New York World Trade Center and Washington Pentagon sites have prevented full attention to this issue.

CONGRESSIONAL ACTIONS OF INTEREST

Representative Holt Introduces a Bill to Reestablish the OTA

Rep. Rush Holt (D-NJ) introduced a bill (HR 2148) to reestablish the Office of Technology Assessment (OTA). The OTA was established in 1972 as a congressional agency to provide Congressional members and committees with objective and authoritative analysis of the complex scientific and technical issues. It was a leader in practicing and encouraging delivery of public services in innovative and inexpensive ways, including distribution of government documents through electronic publishing. The OTA budget was cut in 1995 and its functions were shifted to other agencies. HR 2148 would provide $20 million for each of five years starting with FY 2002. It is still awaiting action. For more on the OTA Legacy, visit http://www.wws.princeton.edu/~ota/.

Representative Norwood Asks DOL to Review TLV® Process

ACGIH TLVs came under scrutiny by Congressman Charlie Norwood (R-GA), Workforce Protection Subcommittee Chair. In a letter to the Secretary of Labor, Elaine Chao, Norwood said the TLVs amount to "secret" government policymaking, because ACGIH is not required to follow federal rulemaking procedures. In addition, Norwood claims a conflict of interest exists between ACGIH members, who create both TLVs and government policies that include TLVs. The letter also asks Chao to take nine actions, including prohibiting "enforcement based on ACGIH TLVs either under the OSHA General Duty Clause or any other OSHA or MSHA standard that provides generic or generally worded health and safety mandates". The ACGIH argues that its TLVs are health guidelines and distinct from consensus standards.

OSHA and NIOSH Budgets Still Await Conference Report

The OSHA budget was increased by $24.4 million over FY 2001 to $450.3 million by the Senate. This exceeds the house increase of $9.4 million. NIOSH would see its 2002 budget increase by $16 million to $276.1 million by the Senate as compared with the House proposed increase of $10 million. The final bill awaits approval by a House-Senate conference committee.

EPA ACTIVITIES

EPA Lowers Arsenic in Drinking Water Standard

On October 31, EPA announced that they were strengthening the drinking water standard for arsenic by substantially lowering the maximum acceptable level from 50 parts per billion (ppb) to 10 ppb. EPA Administrator Christine Todd Whitman said additional information was uncovered that had not been previously considered since the 1999 National Academy of Sciences report. The delay would not affect the 2006 compliance date initially proposed by the Clinton Administration in January 2001. EPA estimates that, of the 74,000 systems regulated by the arsenic standard, 4000 systems

are affected by the new limits. Nearly 97 percent of affected systems are small systems serving fewer than 10,000 people. EPA will be working with those communities to maximize grants and loans available to them. See more on EPA's web site at: http://www.epa.gov/safewater/arsenic.html.

TECHNICAL ARTICLES OF INTEREST

"Simulated Workplace Protection Factor Study of Powered Air-Purifying and Supplied Air Respirators", by **Howard J. Cohen, Lawrence H. Hecker, Darrell K. Mattheis, James S. Johnson, Arthur H. Biermann, and Kenneth L. Foote, AIHAJ 60:5**

Abstract: "A study protocol was developed to obtain simulated workplace protection factor (SWPF) data for eleven models of powered air-purifying respirators (PAPRs) and supplied-air respirators (SAR) with hoods and helmets. Respirators were tested in a chamber that allowed the simulation of 12 exercises, including 2 exercises of interest to the pharmaceutical industry. Each respirator was tested by 12 volunteers, and a total of 144 sets of test results were obtained for each device. The testing protocol allowed SWPFs up to 250,000 to be measured (limit of quantification). Lower fifth percentiles were above 100,000, except for one SAR. An assigned protection factor (APF) was estimated for each respirator by dividing the lower fifth percentile by a safety factor of 25. APFs ranged from 6000–10,000 for PAPRs (including one loose-fitting PAPR) and 3400–10,000 for SARs, with one exception, which had a lower fifth percentile of less than 20 and an estimated APF of 1. Results indicated that most respirators tested could provide a high degree of protection for workers. Direct testing in a simulated workplace seems the only method that will assure employers of choosing an adequate SAR. Furthermore, the historical approach of establishing APFs for classes of respirators, rather than individual models, may not provide adequate protection to the wearer."

The 12 tests performed were: normal breathing while standing, twisting head side-to-side, moving head up and down, bending at waist to touch toes, raising arms above the head, twisting at waist while holding a rod and raising and lowering arms, running in place, normal breathing while standing, scooping of pebbles, normal breathing while standing, building a concrete block wall (move 20 blocks of 32 pounds across the room, and finally normal breathing while standing. The scooping and wall building tasks were added to simulate pharmaceutical-related tasks. All respirators were NIOSH-approved, and the PAPR devised were tested with HEPA filters, and SARs were tested at their minimum airflow if adjustable.

The authors concluded that: "The PAPRs and most SARs examined in this study were capable of achieving protection much higher than the APFs assigned by either NIOSH or ANSI. However, based on the results from SARs, it may be impossible to distinguish high-performing SARs from those that may not offer adequate protection, simply on the basis of choosing a NIOSH-certified device. The results of this study question the safety and adequacy of establishing APFs for classes of respirators as is the current practice by

ANSI, OSHA, and NIOSH. For the protection of workers wearing respirators, APFs should be established based on performance testing for each model."

***"The Role of Stachybotrys Mycotoxins in Building-Related Illness"*,** by **Elena H. Page and Douglas B. Trout, AIHAJ 60:5**

Abstract: "Recently there has been increased attention among both the public and health professionals regarding the potential role of mycotoxins, primarily from fungi of the genus *Stachybotrys,* as etiologic agents related to illness among persons exposed in the indoor (non-industrial) environment. Recommendations for the remediation of buildings are being made based in part on reported health effects believed to be due to mycotoxins. A search of NIOSHTIC and MEDLINE (from 1965 to present) for literature related to fungi, mycotoxins, and the indoor environment was conducted and yielded a total of 13 articles. Important issues concerning exposure assessment and case definitions are inadequately addressed in the literature reviewed, making it difficult to implicate mycotoxins as a cause of building-related illness. The literature review indicates that currently there is inadequate evidence supporting a causal relationship between symptoms or illness among building occupants and exposure to mycotoxins."

***"The Many Aspects of Dermal Exposure Research"*,** by **Mark Boeniger, Synergist, October 2001**

This article was a review of two sessions at AIHCE 2001 dealing with dermal exposures. It reported on a number of interesting aspects of dermal exposure. For dermal risk assessment, there has been a long-standing problem in understanding the relationship between working surface contamination and transfer of contamination to the skin. A study was described evaluating the transfer of contamination from common surfaces as being task dependent or surface dependent. This study found that the mass of contamination transferred to the hands depended strongly on surface loading, hand pressure, skin moisture, and contact time. Mass of contamination transferred to the skin was highest for hard surfaces and followed similar transfers for wipe samples. Roff found that the transfer efficiency to the skin was 3- to 8-fold lower, depending on the surface. In another study, Brouwer found that the area of skin contact more than doubles when the hand contact pressure was doubled. Adherence of contamination to the skin increased 6-fold with 12 repeated contacts over a single contact.

In describing industry experiences, the authors found it preferable to design processes to prevent exposures rather than to rely on workers actions. Substitution of materials and isolation of the process to prevent splashes, sprays, and aerosols, as well as using tools to avoid direct skin contact, were seen as the best means for worker protection. A two-year study of painters found extensive skin exposures in painters using paints with high levels of oligomeric isocyanates. Nitrile gloves were found to provide no skin protection. Skin exposures in five pesticide registrant exposure studies found that the relative contribution of skin exposure among the agricultural workers sampled ranged from 7 to 87 percent of estimated total dose (skin + inhalation).

Interestingly, a study evaluating the effect of cleaning mouse skin with kerosene found that the kerosene disturbed the barrier function of the skin and altered the organ distribution of topically applied benzo[a]pyrene (BaP). The authors found that BaP absorption from used motor oil was enhanced if the skin was subsequently washed with kerosene. The practical message was that one needed to consider not only removal of contaminants, but to what degree the protection properties of the skin may be degraded by the cleaning process.

OTHER ITEMS OF INTEREST

Abstract of *"Welding Essentials"* by **D. D. Wagner, I.H. Olsson, and K. Scheel,** Occupational Health and Safety.

Confined space operations are inherently hazardous, and extra precautions are required whenever welding or cutting is performed in such spaces. Welders come into contact with any number of atmospheric hazards, including fluorides, zinc, lead, mercury, beryllium, cadmium and toxic cleaning compounds, whose dangers can become exacerbated inside confined spaces. OSHA welding work guidelines describe a confined space as a relatively small or restricted space, such as a tank, boiler, pressure vessel or small compartment of a ship.

The article outlines the general requirements of ***OSHA standard 1910.252***, the standard for welding, cutting and brazing, and also directly addresses operations in confined spaces. Another ***OSHA standard, 1915.51***, deals with ventilation and protection for welding, cutting and heating, primarily for shipboard work. Before cutting or welding, spaces must be checked for atmospheric hazards using gas detection instruments. Cutting and welding are prohibited in confined spaces with explosive atmospheres (mixture of flammable gases, vapors, liquids or dusts with air), or in spaces that previously contained those materials and that have not been cleaned or properly prepared. After taking gas detection instrument readings, the space must be adequately ventilated with mechanical ventilators to prevent accumulation of toxic materials or possible oxygen deficiency. Oxygen must NEVER be used to ventilate a space.

The minimum recommended ventilation rate is 2000 ft^3 (57 m^3) per minute per welder, except where local exhaust hoods and booths are present, or when airline respirators are used. All hollow spaces, cavities or containers, should be vented, and care taken to observe for partitions or other barriers that might obstruct cross ventilation.

After ventilation, again take atmospheric readings with gas detection instruments. When the space is ready for entry, the welder must be fitted with any respiratory protection required (***National Institute for Occupational Safety and Health (NIOSH) standard 42 CFR Part 84)***, safety belts and lifeline, along with other required personal protective equipment. A standby attendant, trained in preplanned rescue procedures, must be posted outside of the space. The standby attendant must maintain visual and verbal communication with the welder at all times.

Some operations require work in confined spaces that are immediately dangerous to life and health (IDLH). In such instances, workers must wear a full-facepiece, pressure-demand, self-contained breathing apparatus or a combination full-facepiece, pressure-demand supplied-air respirator with an auxiliary, self-contained air supply. Other precautions include the following:

- *Electrode contact disconnection*. When arc welding is to be suspended for any substantial period of time, such as during lunch, shift change or overnight, all electrodes must be removed from the holders and the holders carefully located so that accidental contact cannot occur. Machines also must be disconnected from their power sources.

- *Torch valve isolation*. Whenever the torch is not used for a substantial period of time, such as lunchtime, shift change or overnight, the torch valves must be closed and the gas supply positively shut off at some point outside of the confined space. This action eliminates the possibility of gas escaping through leaks or improperly closed valves. Where practical, the torch and hose also should be removed from the confined space.

- *Secure cylinders and machinery*. Gas cylinders and welding equipment must be properly secured and left outside of the confined space. Before operations are started, heavy portable equipment mounted on wheels must be securely blocked to prevent accidental movement.

Hard hats and protective eyewear should be readily available. Their cost varies depending on style, use, requirement and quantity. Traditional safety spectacles used to protect against the sun's glare and flying objects can be purchased for only $5 to $10. A basic all-around hard hat costs about $10.

- *Always wear appropriate head protection*. The latest revision to the ANSI Z89 standard organizes hard hats into Type 1, which protects against falling objects, and Type 2, which protects against both falling objects and side impact. Hard hats are further defined as classes G, E and C. Class G head protectors reduce the danger of contact exposure to low-voltage conductors, as well as to the impact and penetration requirements of either a Type 1 or Type 2. Class E hard hats reduce the danger of contact exposure to high-voltage conductors. Class C hard hats provide no protection against contact with electrical conductors.

- *Don't use regular prescription glasses as safety spectacles*. If you wear prescription glasses, you should obtain safety spectacles that incorporate your prescription, or use protective eyewear that comfortably fits over prescription eyewear. Always wear safety spectacles underneath welding helmets, visors and faceshields, which are considered secondary, not primary, protection.

- *Always use a shaded lens when welding, brazing, cutting with a torch, etc*. Welding lenses and visors are manufactured in shades to protect against radiation hazards and are rated from 1 through 14. The higher the shade's number, the

darker the lens and the greater its ability to absorb IR radiation. Welding, cutting, and brazing operations produce three types of radiation. Visually, one can see the brightness, while IR is felt as heat. Invisible UV radiation is also present. A shade 3 lens will transmit about 14 percent of visible light and 9 percent of IR. By contrast, a shade 10 lens transmits only 0.01 percent of visible light and 0.001 percent of IR. For example, if you do light cutting or brazing, use a shade 3 or 5 lens. Arc welding requires a minimum of shade 10. The identification marking for any shade is stamped on the lens.

- *Consult the standards*. Both ***ANSI Z87.1-1989*** and ***OSHA 29 CFR 1910.133*** contain selection charts on shaded lenses for welding, cutting and related applications. Consult these standards for specifics. The CSA Z94.3-92, *Industrial Eye and Face Protectors*, standard lists shaded numbers and their maximum transmittance values for UV, IR and visible light transmission. The Canadian standard also requires that sideshields used to protect against UV, IR and visible radiation have a shade number equal to, or greater than, the front lens filters, but not greater than a shade 5 rating.

- *Use secondary protection as needed*. When a job involves severe impact or other hazards, for example from grinding or sanding, use a face shield or visor as a secondary safety device. OSHA requires that when welding helmets are used, safety spectacles must still be worn as the primary eye protection. The same is true for visors and faceshields. That's because a welding helmet could accidentally flip up, thus exposing unprotected eyes to high glare, high UV and high IR radiation.

"Safe Use and Handling of Mercury" by **D. C. Breeding**

Mercury is a liquid metal that is environmentally persistent and bioaccumulates in the food chain. It occurs in both organic and inorganic forms. The inorganic form can be further divided into elemental mercury and mercuric salts. Organomercury consists of long and short alkyl and aryl compounds. Elemental mercury evaporates at room temperature and reacts with many elements to form salts, amalgams, and organomercury compounds. Elemental mercury and some mercury compounds are listed in state and federal regulations as hazardous wastes.

To help prevent adverse outcomes from mercury use or spills, the article reviews:

- Precautions and controls for safely handling metallic mercury and its compounds.
- Specific guidance for avoiding or limiting metallic mercury spills.
- Guidelines for cleaning up mercury spills.

The author stated that all forms of mercury are toxic. Adverse exposures to mercury can result from inhalation, ingestion, and injection or absorption through the skin. Elemental mercury poses a health hazard because it is volatility. As a vapor, it

penetrates the central nervous system (CNS), where it is ionized and trapped, resulting in its extreme toxic effects. Elemental mercury is not well absorbed by the gastrointestinal tract; therefore, when ingested, it is considered only mildly toxic. Elemental mercury and mercury compounds are highly hazardous if inhaled, or if they remain on the skin.

Dimethyl mercury rapidly penetrates intact skin. Depending on the type of mercury and dose, symptoms may appear relatively quickly (acute disease) or take a number of years to appear (chronic disease). Elemental or airborne mercury that is deposited in water bodies becomes methylmercury, which is much more toxic. In the ambient environment mercury readily bioaccumulates up the food chain.

The various forms of mercury and their effects and hazards are:

- *Mercury vapor (i.e., elemental mercury)* is readily absorbed through inhalation and also can pass through intact skin. After absorption, the blood carries elemental mercury to the central nervous system, where it is oxidized. The oxidation product produces injury. Persons heavily exposed to elemental mercury will develop characteristic symptoms, including: worsening tremors of the hands, shyness, insomnia, and emotional instability (e.g., the symptoms of the Mad Hatter in *Alice in Wonderland* is a caricature of hat makers who originally cured felt in pools of mercury). Mercury vapors can reach very high levels when the liquid is heated. Such levels will cause adverse effects in humans almost immediately if workplace controls are inadequate. Research apparatus and other laboratory equipment such as thermometers, vacuum pumps, manometers, and sphygmomanometers, may contain mercury.

- *Mercury salts* (e.g., mercuric nitrate) are highly toxic and corrosive. They accumulate mostly in the kidney, causing renal damage.

- *Organomercury compounds* attack the CNS, causing tremors, impaired vision and hearing, and paralysis. These compounds also may cause birth defects. The effects from exposure to excessive levels of airborne mercury or skin contact with mercury compounds may not be noticeable for months or years.

- *Mercury fulminate, Hg(ONC)2*, is a detonator used in explosives.

- *Mercury(II) oxide* is an oxidizer. It can cause organic materials to start burning in the same manner as any strong oxidizer.

- *Dimethyl mercury* is a colorless, sweet-smelling liquid. It is a severe fire hazard with a flash point of -4° C. This material rapidly penetrates the skin, resulting in severe to fatal exposure from very minor quantities. Extreme caution is required when working with this material and when selecting personal protective equipment. Contact the vendor, supplier, and/or manufacturer for a current material safety data sheet.

Exposure Limits

A worker's exposure to mercury should be less than the TLV. Following are the maximum exposures permitted for an 8-hour, time-weighted average (TWA) concentration:

Substance	Threshold Limit Value
Mercury metal vapor	0.025 mg/m^3
Mercury salts	0.025 mg/m^3
Aromatic organic compounds	0.1 mg/m^3
Alkyl compounds	0.01 mg/m^3 (Ceiling limit is 0.03 mg/m^3)

Controls for Handling Mercury and Mercury Compounds

Planning and documentation are critical for all operations, procedures, practices, etc., which involve the use of mercury. Following is a discussion of controls for preventing unnecessary exposure and minimizing the likelihood and extent of mercury spills.

Safety Analysis (a.k.a. Hazard Analysis, Project Safety Analysis, JHA, etc.) is a series of procedures to increase the knowledge of hazards in a project or operation by identifying the potential for loss and risk early in the project planning process. Safety Analysis should be performed for all new projects and for ongoing projects where potentially harmful or dangerous conditions present an unacceptable risk.

Safety Analysis defines:

- the proposed project;
- the facilities, apparatus, equipment and chemicals to be used;
- the hazards and risks of each stage of the project;
- the necessary controls for preventing potential harmful exposures and/or releases;
- standardized safe work practices and procedures;
- the ultimate disposition of apparatus, equipment, materials and chemicals; and
- cleanup and decontamination of facilities, instrumentation, equipment, etc.

Engineering Controls

- Ventilation and/or vapor-containment systems.
- Mercury Spill-Control Kits. These kits should be positioned in all work areas where more than 1.0 ml of mercury is used (except for small sealed items, such as thermometers and sphygmomanometers). Spill control kits should be replaced or restocked following each use. Employees should contain and control spills and/or summon the appropriate Hazardous Materials Emergency Response Team for cleanup and disposal.
- Catch basins and pans made of smooth, impervious material (e.g., plastic or smooth-finish paint) with edge lips. Steep edge lips are more effective than gentle rises in trapping spilled mercury. Catch basins should be large enough to contain the greatest amount of mercury that could spill and be positioned to catch mercury droplets escaping from any plausible direction. (It may be useful to place absorptive mats on seamless, plastic sheets in or under catch pans to capture mercury leaks from the equipment. Droplets of mercury can then be collected by simply wrapping up the plastic with the mat still inside and disposing of it as mercury waste.)
- Removable plastic shields, mercury traps, and blowout valves.
- Concrete floors should be sealed with epoxy. Impervious working surfaces with few crevices are preferred for work involving mercury. Carpeted and tiled areas should not be used.

Administrative Controls listed in this section should be implemented when mercury and its compounds are involved in operations.

Hazards Assessment

Before beginning a project or operation involving the use of metallic mercury, mercury compounds, mercury apparatus, or equipment containing mercury, the responsible individual(s) should:

- Prepare an Integration Work Sheet (IWS) for the operation, become familiar with the hazards associated with the materials for the particular operation, and implement all necessary controls. The current MSDS must be obtained for each hazardous material, including mercury and mercury compounds, describing its hazards and controls.
- Determine whether the workers' current training is adequate for the activity. All affected personnel should complete training in Laboratory Safety, Hazard Communication, operation of specific apparatus and equipment, and safe work practices and procedures. All training should be documented and records maintained as required.

- Notify the Environmental Health & Safety Department of each new use of mercury, except for small sealed items such as thermometers. A formal Safety Analysis should be required for all new projects and for ongoing projects when significant changes occur or when hazardous conditions warrant.

The author provided some guidance on what a local Environmental Health & Safety Department should do and provided information on employee information & training. The article then focuses on safe work practices for the use of dimethyl mercury:

> Dimethyl mercury is so toxic that its use always requires an Operational Safety Plan (OSP). Additionally, inner (laminate-style) gloves and outer gloves (heavy-duty nitrile or neoprene, with long cuffs) are required as a minimum when handling, using, or working with dimethyl mercury.
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> For all forms of mercury, the following work practices apply:
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> - Avoid using mercury whenever possible. Use alternative methods, equipment, and/or instruments that have no mercury to measure temperature or pressure. Where alternative materials or methods are available, prudent laboratory practice requires choosing the less hazardous alternative.
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> - Depending on the type and concentration of mercury involved and the work to be done, additional PPE may be required above the minimum for other materials.
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> - Do not eat, drink, smoke, or store food, drinks, smoking materials, or cosmetics in any area where mercury is in use.
>
> - Avoid skin and eye contact. Use appropriate protective gloves when handling metallic mercury. **DO NOT** use lightweight disposable gloves for heavier jobs, as these can tear easily and allow mercury to lodge under the fingernails or contact other parts of the skin. When the operation may result in exposure to the face, wear splash-proof goggles **AND** a face shield, unless full-face respiratory protection is being used. **Note:** Quantitative permeation or penetration information is scarce on the type of gloves or protective clothing that offer protection from exposure to mercury compounds.
>
> - Wash hands and face after handling mercury, before lunch or breaks, and at the end of each work period.
>
> - Do not work with mercury on surfaces with cracks (e.g., tile seams, spaces between wood boards, baseboards, wall coving, gaps between table legs and floors), crevices, and hard-to-reach spaces; porous surfaces (e.g., carpets, wood, and crinkle-texture paint); and false floors.
>
> - Do not store or handle mercury near sinks or drains. Spilled mercury could run into the sink, lodge in the trap, ruin the pipe by amalgamating with and weakening the metal, and then be released into the environment or a retention tank system designed only for dilute solutions in rinse water.

Mercury in the plumbing and drains may result in unnecessary and potentially adverse exposure to maintenance workers and others.

- Avoid using mercury or mercury compounds in operations that could generate mercury waste streams contaminated with radionuclides, as it is expensive and often impossible to dispose of this type of mixed waste stream. Where the project necessitates the generation of a mercury waste stream with radionuclides, the responsible individual is required to document appropriate arrangements for proper waste disposal or long-term storage of the waste, as in compliance with the location's radiation safety and hazardous waste management program.
- Transfer liquid mercury between containers in a fume hood and/or over a tray or pan to confine any spills.
- Conduct weekly self-inspections of all PPE, controls, equipment, and apparatus. Document inspection findings and corrective action(s).

Medical Surveillance

An occupational medicine physician should determine the need for biological monitoring or medical surveillance examinations of workers with potential mercury exposure. The requisite biological monitoring or medical surveillance examinations should be determined based on an evaluation of the operation, workplace controls, and relevant human factors, as well as input received from the responsible individual, affected workers, and safety officers. At a minimum, all affected persons should be monitored for mercury in blood and urine *before* working with mercury to establish a baseline for evaluation, and at least every three months for project duration.

Labeling and Storage

The following controls apply to the labeling and storage of mercury and its compounds:

- Label all containers and storage of metallic mercury and its compounds.
- Do not store mercury near chemicals that can create explosive mixtures with mercury (e.g., acetylene, ammonia, boron phosphodiiodide, chlorine dioxide, methyl azide, ground sodium carbide, and others) or with radioactive materials. Keep mercury compounds that are oxidizers separate from organic materials and other combustibles.
- Minimize the amount of mercury in use or in storage. Mercury storage should have inherent spill containment/control.
- Store mercury in a cool, separate, and secure location.
- Use containers made of impact-resistant material or place them in sturdy secondary containers.

- Keep all mercury containers tightly closed when not in use. Avoid cutting cartons that contain plastic bottles filled with mercury. A plastic bottle could be cut or torn open and result in a mercury spill.

Use appropriate packing materials, such as Kimpak™ or bubble pack, for mercury containers and objects/devices containing mercury.

IAQ Tech Tip #63: New Instrumental Technologies for IAQ Detection

The growth of the Indoor Air Quality industry has been tremendous; unfortunately much of the science has not kept pace with the industry. Many of the most commonly used sampling methods rely heavily on technologies developed in the 1920s to 1950s. These include: impaction onto agar media for bacteria and fungi, fungal spore trapping on acetate or greased slides, trapping bioaerosols into liquid (impinger), filtration for particulates such as allergens and endotoxins, and sorbent tubes trapping VOCs, MVOCs and pesticides.

There have been more modern techniques that have been successfully introduced into the field, such as laser particle counters, environmental monitors (RH, temperature, oxygen, carbon dioxide) and real-time gas monitoring instruments (including photoionization detectors (PIDs) and electrochemical or catalytic bead sensors). All of these can provide information useful to bioaerosol investigations in certain situations.

The development of real-time analytical instruments for pesticides, VOCs and/or MVOCs will be one of the major advances in the field IAQ bioaerosol arena. Two systems, both based on field chromatographic separations, have recently been described that hold promise for IAQ applications. The zNose® offered commercially from Electronic Sensor Technology in Newbury Park, California and the uChemLab® under development by Sandia National Laboratories in Albuquerque, New Mexico.

One of the major obstacles facing microbial IAQ laboratories is the time and labor required to isolate and identify the microfloral populations. The advent of the Air-O-Cell® by Zefon International is one of the major contributors to the dramatic increase in requests for analytical services. The Air-O-Cell® provides a very convenient method for rapidly profiling the fungal population in air. However, this method, as with any spore-trap technique, is both time and labor intensive and certain genera, such as ones that produce small clear spores (e.g. Penicillium, Aspergillus, Tricho-derma), are not distinguishable microscopically.

Culturing, either by conventional plating or following impaction onto agar plates, can distinguish genera and even species. Unfortunately, it requires extended time periods depending on the organism. Once grown, representative individual organisms must be separated from the rest of the microbial population and then identified by conventional or biochemical means.

Another well established biochemical method used for bacterial identification is fatty acid profiling (FAME) analyzed by gas chromatography following chemical esterification. This method, although reportedly used for fungi, is less reliable in resolving species due to the fatty acid variability inherent with these organisms.

This article was an abstract from a future article by Vincent Miller Ph.D. from Aerotech Laboratories for the IAQ Tech Tips. (http://www.aerotechlabs.com/)

*"**Safety in Numbers**"*, by ***Tony Cantarella,*** Occupational Health and Safety

"As companies look for ways to make themselves more competitive -- particularly in the current economy -- it is important for them aggressively to examine ways to control costs and weather difficult times. Company management has in many cases come to view insurance premiums for worker's compensation as just another fixed overhead expense, rather than looking at these premiums as controllable costs. This is where a culture shift at all levels of the organization can save millions of dollars a year."

Safety Manager's Job is Evolving

A recent article in Occupational Hazards discussed the changing role of the safety manager. However, it applies equally well to industrial hygiene managers. With the shrinking of manpower, safety needs to be integrated into the business processes of an organization. Safety managers need to rely on the actions of others to accomplish their goals. As one moves to management, he or she need to work within the organization's strategy; concentrating more on management goals than individual accomplishments. This means having to convince other managers of the value of your actions to the "bottom line." Also, more is being accomplished through education and training that hands-on efforts of any safety professional.

In addition, safety managers are being called upon to be more multi-disciplinary. The focus on OSHA is being integrated with EPA and environmental issues. Functions dealing with worker's compensation, security, and disaster planning are being added to the job requirements. Expanding your competencies makes you more valuable to the organization, and can help in the event that downsizing comes to play.

INTERNET NEWS

NIOSH Posts Respirator Cleaning Procedures

NIOSH provides a web page listing suggested respirator cleaning and sanitizing procedures. Depending on whether the respirator is to be used by a single user, or by multiple users, one of three cleaning methods can be used. See the details at: http://www.cdc.gov/niosh/respcln.html.

NIOSH Publishes Guide for Eye Safety

A new NIOSH web page, Eye Safety for Emergency Response and Disaster Recovery, contains a detailed analysis of the hazards, evaluation methods, and equipment available for this specialized situation. See the details at: http://www.cdc.gov/niosh/eyesafe.html.

Health Canada offers MSDS for Biologicals

The Population and Public Health Branch of Health Canada has made available a series of MSDSs for biologicals. These MSDSs are produced for personnel working in the life sciences as quick safety reference material relating to infectious microorganisms. The MSDSs are organized to contain health hazard information such as: infectious dose, viability (including decontamination), medical information, laboratory hazard, recommended precautions, handling information and spill procedures. The intent of these MSDSs is to provide safety resources for laboratory personnel working with these infectious substances. To view the index, visit their web page at: http://www.hc-sc.gc.ca/pphb-dgspsp/msds-ftss/.

New NIOSH Web Site for Emergency Responder Resources

NIOSH has listed a number of resources for emergency responders that cover *B. Anthracis*, dust, asbestos, carbon monoxide, use of PPE and other essential information. These resources are posted at: http://www.cdc.gov/niosh/emres01.html.

USPS Posts Mail Security Guidelines

For US Postal Service and mail security information and announcements view, http://www.usps.com/news/2001/press/

INDUSTRIAL HYGIENE PROFESSIONAL NEWS

ACGIH Reaches Settlement in Trona Lawsuit

In December 2000, a lawsuit was filed on behalf of the Trona industry claiming that the TLV process was an illegal and secret rulemaking. Trona (sodium sesquicarbonate) is a mineral used in a variety of consumer goods, including baking soda, glass, detergents, and animal feed. In September, ACGIH settled the second of the lawsuits stemming from its TLV procedures. ACGIH states that they found, during the discovery process, that a “senior member of the TLV Committee” had “provided factually incorrect information” on when the TLV matter would be discussed and “led plaintiffs to initiate a study and made promises to plaintiffs” which led them to believe their data would be considered by the committee.

ACGIH acknowledged that “while there is evidence of irritation caused by exposure to any dust at some threshold level, there is no evidence at this time of health effects, other than a potential transient irritant effect, from exposure to Trona.” ACGIH is withdrawing its Notice of Intended Change on Trona and will be working to study and

improve its conflict of interest policy, its TLV process, and its overall operation. The settlement statement is available on the ACGIH web site at http://www.ACGIH.org/.

In a related item, the AIHA Board voted during their meeting at the PCIH to donate $100,000 to ACGIH to help with its estimated $400,000 in expenses related to the challenges to the TLVs.

AIH Votes to Include Certified Associate Industrial Hygienists

The Academy of Industrial Hygiene Board voted during their annual meeting in St. Pete's Beach, FL, to petition the full AIHA Board to admit persons who attain the American Board of Industrial Hygiene's newest credential, the CAIH, as diplomate members. The AIH conducted a survey of its members prior to its latest deliberations. A majority of those responding were in favor of recognizing CAIHs as eligible for Academy membership. The AIHA Board is now considering the petition for future action.

BCSP Updates Ethics Code

The Board of Certified Safety Professionals has had a Code of Ethics for many years. A new edition has been recently approved and becomes effective for those candidates signing their next application form or for current ASPs and CSPs when they renew with BCSP in 2002. The Code is available for review on their web site at: http://www.bcsp.org/code.html.

ANSI Issues New Respiratory Protection, Ventilation Standards

ANSI has approved three new standards through Secretariats within the AIHA. Two of the standards are from the Z88 Committee on Respiratory Protection:

- ANSI Z88.7 – *Color Coding of Air Purifying Respirator Canisters, Cartridges, and Filters;* and

- ANSI Z88.10 – *Respirator Fit Testing Procedures*, a new standard, provides guidance for fit testing of tight-fitting respirators.

The third standard was produced by the Z9 Committee:

- ANSI Z9.2 – *Fundamentals Governing the Design and Operation of Local Exhaust Systems*, which describes good practices for the design, installation, operation, maintenance, and testing of local exhaust ventilations systems used to control employee exposures to airborne contaminants.

ANSI Z9 Committee Considering New Standard Proposal

The Accredited Standards Committee Z9, Health and Safety Standards for Ventilation Systems, is considering a proposal to develop a standard on the management, operation, maintenance, and testing of HVAC systems for maintaining acceptable indoor air quality in employee occupancies. In June 2000, a task group was assigned to explore development of a standard in this area. They explored eight relevant questions and made recommendations:

1. There was a consensus that a narrowly focused, non-design, IAQ-related standard was needed.

2. There would be some overlap with existing standards, and this would not be a problem.

3. ASHRAE 62 is primarily a design standard, and emphasizes comfortable, healthy conditions for building occupants. It deals little with management, operation, testing, and maintenance of existing systems.

4. OH&S concerns were not felt to be well dealt with in existing standards, and a new, targeted standard was warranted. The group would still need to consult with existing standards organizations in development of this new standard.

5. Benefits would be: added guidance for OH&S professionals, filling a gap in OSHA standards for IAQ, involvement of OH&S professionals in the process, and enhanced employee health.

6. ANSI Z9 was felt to be the appropriate place for this standard development.

7. The standard would be a performance-oriented document describing recommended practices for management, operation, testing, and maintenance of acceptable IAQ through dilution ventilation.

8. A core group of six to ten professionals would make up the voting subcommittee.

Interested parties with comments, pro or con, should contact Jeff Burton, task group chair at JeffBurton@digitalpla.net.

PUBLICATIONS

NIOSH Releases August 2001 edition of its database CD-ROM

NIOSH has released the August 2001 edition (Publication No. 2001-145) of the NIOSH Pocket Guide to Chemical Hazards and Other Databases CD-ROM. While the number of databases remains the same as the previous July 2000 edition (Publication No. 2000-130), the entire set of International Chemical Safety Cards has been updated, additional information on chemical protective clothing has been included, and several new OSHA and NIOSH measurement methods have been added. Also included is a JavaScript applet for converting airborne chemical concentrations from mg/m^3 to ppm (and the reverse). Databases included are:

- Immediately Dangerous to Life and Health Concentrations (IDLHs)
- International Chemical Safety Cards (WHO/IPCS/ILO)
- NIOSH Manual of Analytical Methods (NMAM)
- NIOSH Pocket Guide to Chemical Hazards (NPG)
- OSHA Sampling & Analytical Methods
- Recommendations for Chemical Protective Clothing
- Specific Medical Tests Published for OSHA Regulated Substances
- Toxicologic Review of Selected Chemicals
- 2000 Emergency Response Guidebook
- NIOSH Certified Equipment List as of March 31, 2001

Complimentary copies of this CD-ROM publication can be obtained from the NIOSH Publications Office, 4676 Columbia Parkway, Cincinnati, OH 45226. Phone: (800) 35-NIOSH Fax: (513) 533-8573 E-mail: pubstaft@cdc.gov

ARMY ITEMS OF INTEREST

USACHPPM Releases Basic Bacillus anthracis Risk Action Matrix

USACHPPM Directorate of Clinical Preventive Medicine has released a set of documents recommending worker protection techniques for *B. Anthracis.* The information contained in these documents is based upon current understanding of the science and published guidance documents surrounding this issue. The decision matrix and glossary cover actions stemming from receipt of a credible threat, positive sample results, or routine mail handling. CHPPM has posted a resources page on their web site for these and other anthrax-related materials. Visit this page at http://chppm-www.apgea.army.mil/HomelandSecurity/anthrax.asp**.** In addition, CDC released interim guidelines to protect those handling mail. It is available from their web site at: http://www.cdc.gov/niosh/unp-mailrecs1.html

Defense Occupational and Environmental Health Readiness System Update

Significant changes have occurred recently within the DOEHRS Project. On 1 October 2001, CPT Steve Spellman, was appointed the DOEHRS Project Manager by COL John Reyburn, USAF, the Clinical Integrated Technology Program Office (CITPO) Program Manager. This appointment for CPT Spellman also included a change in the duty station from USACHPPM to the CITPO, located in Falls Church VA. Although DOEHRS has always been a DOD Project, supported by the USACHPPM Commander, this move was a necessary step for the continued success of the DOEHRS Project. Mr. Monk will resume the role of OHMIS Program Manager, and continue to provide support to the DOEHRS Project as well as other IM/IT initiatives within CHPPM.

The DOEHRS Project Management Office located at USACHPPM is being re-named the DOEHRS Technical Integration Office (TIO). The current DOEHRS technical staff, under the direction of Ms. Brenda Wolbert will remain intact in support of the DOEHRS Project. The DOEHRS PMO now resides at the CITPO in Falls Church, VA.

The DOEHRS-Hearing Conservation Application (HC) is preparing for a maintenance release that will include performance enhancements, an ad-hoc reporting tool, and increased security requirements. Tentative dates for this release are in the January-February 2002 time frame. Long-term plans for DOEHRS-HC are for integration into CHCS II Block 3.

The DOEHRS-Data Repository (DR) went into production on 4 June 2001. The DOEHRS-DR is a fully web-based accredited application currently available to DOD hearing conservation users worldwide. Additional enhancements, automation processes and performance tuning continue to be provided to the functional community. The DOEHRS Technical Integration Office (TIO) is implementing Oracle Discoverer as the ad-hoc reporting tool for the DR. This capability is projected to be available by the end of December 2001. Development of the IH functional reporting requirements is projected to start in 2002.

The DOEHRS-Industrial Hygiene application has been in a holding pattern since June 2000, due to significant contractual issues with the developer. A new request for proposal (RFP) was recently issued and the DOEHRS PM is currently reviewing submissions from 3 developers. One of the requirements in the RFP is to look at the potential re-use of existing code in selective systems, including the Air Force Command Core System (CCS). If code reuse can shorten the development time line, and still meet the DOD functional requirements, then it will be used. The selection and award is anticipated to occur in December 2001. Rest assured the Army will continue to be a major player during the development of the DOEHRS-IH product via functional and technical representation to the DOEHRS PM.

HHIM Support Changes

The TMSSC Help Desk is no longer in existence. The Military Health System (MHS), Chief Information Officer, mandated that all MHS funded systems use the recently awarded contract to IBM for all Help Desk and Tier 2 type support. This transition has been difficult and is still in process. As the HHIM is an Army system, they have decided to keep all Help Desk and Tier support within the Army, at the DOEHRS PMO, USACHPPM under the direct oversight of the OHMIS Program Manager, until the DOEHRS-IH application is fielded. This transition took effect on 1 October 2001, and the new number for HHIM Help Desk issues is as follows:

- DSN: 584-2926
- COM: 410-436-2926

These numbers may be familiar to you as they are the same phone numbers as the DOEHRS PMO. DOEHRS has also created an email account for those who prefer to use email to contact the help desk. This account is:

CHPPMHHIMSupport@APG.AMEDD.ARMY.MIL

These are the only numbers to use for HHIM Help Desk support. They look forward to improving on the Help Desk Support and welcome your ideas and suggestions

JUST THE FACTS

NIOSH Study Reports on Work-related Fatalities

NIOSH has issued two reports based on a comprehensive assessment of the more than 93,000 fatal work-related injuries during the period 1980-1995: DHHS (NIOSH) Publication No. 2001-129, "Fatal Injuries to Civilian Workers in the United States, 1980-1995 (National Profile)," and Publication No. 2001-129S, "Fatal Injuries to Civilian Workers in the United States, 1980-1995 (National and State Profiles)."

In the new documents, NIOSH reported that:

- The number and rate of fatal occupational injuries decreased from 1980 through 1995. The number decreased 28 percent from 7,343 deaths in 1980 to 5,314 in 1995. The average annual rate declined 42 percent from 7.4 deaths per 100,000 workers in 1980 to 4.3 per 100,000 in 1995.
- The greatest number of fatal occupational injuries for the 16-year period occurred in California, Texas, Florida, Illinois, and Pennsylvania. The highest occupational fatality rates per 100,000 workers occurred in Alaska, Wyoming, Montana, Idaho, West Virginia, and Mississippi.

- Leading causes of job-related death during the 16-year period were motor vehicle crashes, homicides, machine-related incidents, falls, electrocutions, and being struck by falling objects.
- Male workers had a job-related fatality rate 11 times higher than the rate for female workers.
- Workers 65 years and older had the highest fatality rate of all age groups in every industry and occupation.

The two documents are available by calling the NIOSH toll-free information number, 1-800-35-NIOSH (1-800-356-4674). They also are available on the NIOSH web page at www.cdc.gov/niosh/civinj.html.

Facts About Anthrax

Source : http://www.bt.cdc.gov/DocumentsApp/FactSheet/Anthrax/about.asp

- Anthrax is an acute infectious disease caused by the spore-forming bacterium *Bacillus anthracis*. Anthrax most commonly occurs in hoofed mammals and can also infect humans.
- Symptoms of disease vary depending on how the disease was contracted, but usually occur within 7 days after exposure. The serious forms of human anthrax are inhalation anthrax, cutaneous anthrax, and intestinal anthrax.
- Initial symptoms of inhalation anthrax infection may resemble a common cold. After several days, the symptoms may progress to severe breathing problems and shock. Inhalation anthrax is often fatal.
- The intestinal disease form of anthrax may follow the consumption of contaminated food and is characterized by an acute inflammation of the intestinal tract. Initial signs of nausea, loss of appetite, vomiting, and fever are followed by abdominal pain, vomiting of blood, and severe diarrhea.
- Direct person-to-person spread of anthrax is extremely unlikely, if it occurs at all. Therefore, there is no need to immunize or treat contacts of persons ill with anthrax, such as household contacts, friends, or coworkers, unless they also were also exposed to the same source of infection.
- In persons exposed to anthrax, infection can be prevented with antibiotic treatment.
- Early antibiotic treatment of anthrax is essential – delay lessens chances for survival. Anthrax usually is susceptible to penicillin, doxycycline, and fluoroquinolones.

- An anthrax vaccine also can prevent infection. Vaccination against anthrax is not recommended for the general public to prevent disease, and is not currently available.

ADMINISTRATIVE INFORMATION

This document was prepared for the U.S. Army Center for Health Promotion and Preventive Medicine (USACHPPM), Directorate of Occupational Health Sciences. The POC at the USACHPPM is Mrs. Sandra Monk; Program Manager; Industrial Hygiene Management Program; DSN: 584-2439; COM: 410.436.2439; e-mail: Sandra.Monk@apg.amedd.army.mil.

This document summarizes information and regulatory actions that are relevant for Army Industrial Hygiene Program personnel. We distribute this summary in electronic form only. Please make it available to your staff if they do not have direct access to an electronic copy. If you would like to be added to the electronic mailing list or if your e-mail address changes, please contact Tammy Budkey, e-mail: tammy.budkey@apg.amedd.army.mil; or call her at DSN: 584-2439; COM: 410.436.2439; fax: 410.436.8795.

At a minimum; we review the following publications in preparing this summary: AIHA Journal; the Synergist; Today (ACGIH's Newsletter); The AAIH Newsletter; OSHA Week; the Federal Register; BNA OSHA Reporter; Applied Occupational and Environmental Hygiene; The Journal of Occupational and Environmental Medicine; The Journal of Environmental Health; Professional Safety; Safety and Health, Occupational Hazards; Occupational Health and Safety; and Industrial Safety and Hygiene News. We also gather information from a variety of sources on the Internet.

If you have questions or comments; please contact Jim Evenden at jevenden@lmi.org; 410.638.2081/2086 (voice) or 2093 (fax).